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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/037,423	10/24/2001	Richard B. Ertel	907B.0003.U1(US)	7192
29683	7590	09/06/2005	EXAMINER	
HARRINGTON & SMITH, LLP			PHU, PHUONG M	
4 RESEARCH DRIVE			ART UNIT	
SHELTON, CT 06484-6212			PAPER NUMBER	

2631

DATE MAILED: 09/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/037,423

**Applicant(s)**

ERTEL ET AL.

**Examiner**

Phuong Phu

**Art Unit**

2631

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 October 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 19 is/are allowed.
- 6) ☒ Claim(s) 1,4-7,10,11,13 and 16-18 is/are rejected.
- 7) ☒ Claim(s) 2,3,8,9,12,14 and 15 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 4, 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Yun et al (5,886,988).

-Regarding to claim 1, see figure , Yun et al discloses a method comprising:

step (100) (see figure 1), within a coverage area of a base station (BS), of having a multi-element antenna array (18, 19), estimating a spatial signature vector (SSV) for individual ones of a plurality of active subscriber stations (SSs) (see  $A_k$  of Eq. 3, col. 10, lines 38-53); and

step (100) of assigning a system resource (channel assignment) to a subscriber station (SS) that minimizes the similarity of the determined SSVs of the SSs sharing the system resource (see col. 9, lines 23-44, col. 12, lines 31-43).

-Regarding to claim 4, Yun et al discloses step (100) of beamforming using the multi-element antenna array so as to maximize the signal to interference plus noise ratio (SNR) for a signal transmitted from a first SS by steering a null towards a second potentially interfering SS to minimize interference from the second SS (see figure 2, col. 2, lines 48-63).

-Regarding to claim 5, Yun et al discloses step (100) of receiving the signal received from the desired SS, followed by a step of spatial filtering (46) (see figure 1).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 7, 10, 11, 13, 16, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yun et al.

-Regarding to claims 7, 13, similarly as applied to claim 1, Yun et al discloses a system comprises:

step/means (100) (see figure 1), within a coverage area of a base station (BS), of having a multi-element antenna array (18, 19), estimating a spatial signature vector (SSV) for individual ones of a plurality of active subscriber stations (SSs) (see Ak of Eq. 3, col. 10, lines 38-53); and

step/means (100) of assigning a system resource (channel assignment) to a subscriber station (SS) that minimizes the similarity of the determined SSVs of the SSs sharing the system resource (see col. 9, lines 23-44, col. 12, lines 31-43).

Yun et al does not disclose whether the channel assignment is assigning a spreading code to the subscriber station (SS).

However, Yun et al discloses that his system can be applied for CDMA systems (see col. 1, lines 16-30).

On the other hand, assigning channel to a station by assigning a unique spreading code to that station in a CDMA system is well-known in the art, and the examiner takes Official Notice.

Therefore, for an application, it would have been obvious for one skilled in the art to implement Yun et al in such a way that means (100) would assign a system resource (by assigning a spreading code) to a subscriber station (SS) that minimizes the similarity of the determined SSVs of the SSs sharing the system resource, as being required.

-Regarding to claims 10, 16, Yun et al discloses that means (100) processor further operates beamforming circuitry with said multi-element antenna array so as to maximize the signal to interference plus noise ratio (SINR) for a signal transmitted from a first SS by steering a null towards a second same-code SS to minimize interference from the second same-code SS (see figure 2).

-Regarding to claims 11, 17, as applied to claim 7, in Yun et al in view of Barratt et al, a despreader is inherently included for despreading a signal received from SSs in order to decode the received signal from a respectively assigned spreading code. Yun et al further teaches as a spatial filter (46) for processing the received signal (see figure 1); therefore, in Yun et al in view of Barratt et al, the spatial filter is inherently coupled to said despreader.

5. Claims 6 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yun et al, in view of Barratt et al (5,592,490).

-Regarding to claim 6, Yun et al discloses step (100) of, from the spatial signature vectors ( $A_{k,j}$ ) received from a plurality of same-code subscriber stations, computing antenna element weight vectors ( $W_{k,j}^D$ ) (see col. 15, lines 25-45).

Yun et al does not disclose in detail how the spatial signature vectors are obtained, as claimed.

However, Yun et al teaches that the spatial signature vectors can be obtained with a method taught by Barratt et al (see col. 8, line 64 to col. 9, line 17, col. 15, lines 47).

Barratt et al teaches obtaining spatial signature vectors by operating the SSs to obtain channel estimates ( $a_{br}$ ) comprised of the path amplitude and phase from each of m antenna elements and to use the m channel estimates as spatial signature vectors (see col. 3, lines 26-59).

Therefore, it would have been obvious for one skilled in the art to implement Yun et al in such a way that each of spatial signature vectors are respectively obtained by operating the SSs to obtain channel estimates comprised of the path amplitude and phase from each of m antenna elements and to use the m channel estimates as the spatial signature vectors, as taught by Barratt et al, in order to obtain the spatial signature vector as being required for computing antenna element weight vectors.

-Claim 18 is rejected with similar reasons set forth for claim 6.

#### ***Allowable Subject Matter***

6. Claim 19 is allowed.

7. Claims 2, 3, 8, 9, 12, 14 and 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phuong Phu whose telephone number is 571-272-3009. The examiner can normally be reached on M-F (6:30-2:30).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Phuong Phu  
08/29/2005

**PHUONG PHU**  
**PRIMARY EXAMINER**

Phuong Phu  
Primary Examiner  
Art Unit 2631